To: Narvaez, Madonna[Narvaez.Madonna@epa.gov]; Doolan, Stephanie[Doolan.Stephanie@epa.gov]; McClintock, Katie[McClintock.Katie@epa.gov]; DAVIS George[DAVIS.George@deq.state.or.us]
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From: MONRO David
Sent: Wed 2/17/2016 10:45:15 PM
Subject: RE: do you know a hexavalent chromium expert in OAQPS?

All – thanks for starting this out. At this point we are planning on meeting with Bullseye on Friday at 2:00 pst. Is there anyone from this groups who is able to join the call and assist with the technical discussion (specifically re: tri to hex emissions potentials from the glass furnace)?

David Monro

Air Quality Manager, Northwest Region

office: 503.229.5160

cell: 503.793.9635

From: Narvaez, Madonna [mailto:Narvaez.Madonna@epa.gov]
Sent: Wednesday, February 17, 2016 12:05 PM
To: Doolan, Stephanie; McClintock, Katie
Cc: McCullough, Hugh; Fairchild, Susan; MONRO David; Johnson, Steffan; Pope, Anne; Dewees, Jason; Merrill, Raymond; Werner, Leslye
Subject: RE: do you know a hexavalent chromium expert in OAQPS?

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Cc: McCullough, Hugh <McCullough.Hugh@epa.gov>; Fairchild, Susan

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OAQPS/SPPD/MMG

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USEPA, Region 10

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MC: AWT-150

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fax: 206-553-0110

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I've included George Davis on this email. He is DEQ's current contact for the technical discussions.

Please excuse any brevity, grammar or spelling as this was sent with a mobile.

-------- Original message --------
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MC: AWT-150
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From: Doolan, Stephanie
Sent: Wed 2/17/2016 7:36:35 PM
Subject: Re: do you know a hexavalent chromium expert in OAQPS?

I'm out of the office today, but can send you the information from our air monitoring efforts. We did monitor for hex chromium with good, low level results. You can make some educated assumptions about how much will be hex, but without data, it's hard to know.

Sent from my iPhone

On Feb 16, 2016, at 11:18 PM, McClintock, Katie <McClintock.Katie@epa.gov> wrote:

> Thank you all for your thoughtful help.
>
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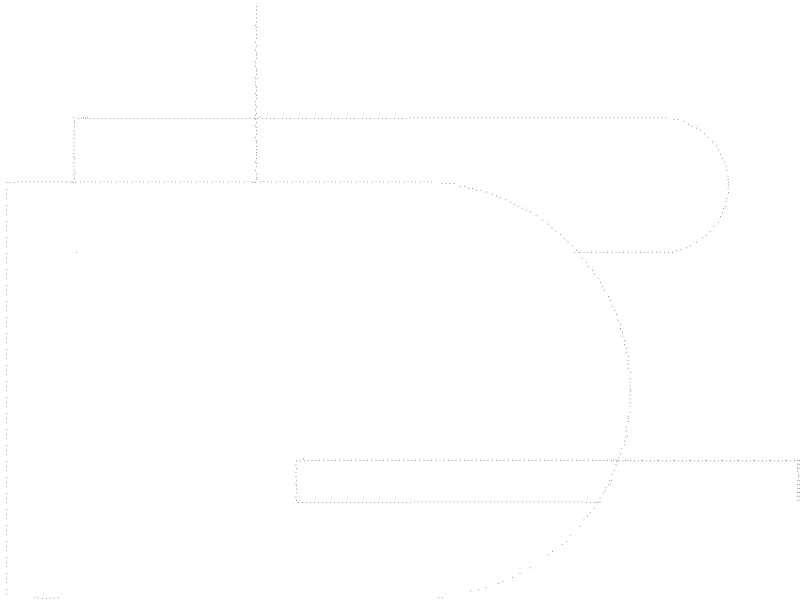

All true, and there is some experience with hexavalent chrome in ambient air.

Once the hexavalent chrome is diluted in ambient air it must come in contact with something to oxidize for it to convert back to trivalent chrome. The concentration of hexavalent chrome in ambient air is very low. You could check with Dave Shelow in the ambient monitoring group for NATTS data from his monitoring stations. Of note are the exceptions like the time the ambient folks were sampling for the 24 hour period on July 4 down wind of a fireworks display. In that case they measured increased levels of hexavalent chrome, demonstrating that this oxidation state of chrome does exist in ambient air.

The ambient samples are collected on an alkaline coated filter to stabilize the hex chrome.

Ray

Raymond Merrill Ph.D. (Ray)| USEPA/OAQPS/AQAD/Measurement Technology Group

109 TW Alexander Drive (E143-02) | Research Triangle Park, NC 27711

email: merrill.raymond@epa.gov | Phone (919)541-5225 | Fax: (919) 541-0516

From: Johnson, Steffan
Sent: Tuesday, February 16, 2016 3:07 PM
To: McClintock, Katie
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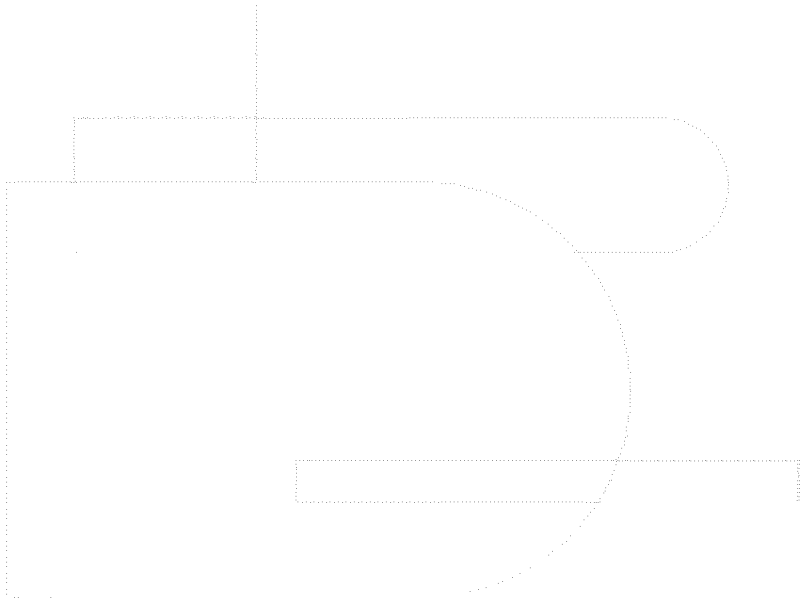

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To: Narvaez, Madonna <Narvaez.Madonna@epa.gov>; Pope, Anne <Pope.Anne@epa.gov>
Cc: Fairchild, Susan <Fairchild.Susan@epa.gov>; Dewees, Jason <Dewees.Jason@epa.gov>; Merrill, Raymond <Merrill.Raymond@epa.gov>
Subject: RE: do you know a hexavalent chromium expert in OAQPS?

Madonna,

In my experience hexavalent forms of chromium are not stable when they are emitted from a

source. In fact, EPA has put a good bit of effort into developing a test method designed specifically to capture hex-chrome compounds and keep them in hex form until analysis, as other chromium emissions test methods tend to let the chromium convert to trivalent forms. It is also my understanding (though certainly not the final word on the topic at all) that hex chrome emissions are likely to change state to trivalent chrome post-emission. I believe Jason DeWees and Ray Merrill of my group may also have information to add here, and so I am copying them on this e-mail.

The only reliable test approach that I know to quantify in-stack emissions of hex-chrome is to use a test method known as SW-846-0061. This method uses an alkaline reagent to trap hex-chrome and retain it in hexavalent form until the alkaline solution can be analyzed at a lab. The test method is a bit tricky, but if you need to know in-stack emissions we're certainly available to help you walk through development of a test protocol.

As to ambient sampling for hex chrome, I'll let Hugh in R7 tell you what he knows, my experience stops at the stack.

Please let us know if we can be of further assistance.

Stef

From: Narvaez, Madonna
Sent: Tuesday, February 16, 2016 12:26 PM
To: Pope, Anne <Pope.Anne@epa.gov>
Cc: Fairchild, Susan <Fairchild.Susan@epa.gov>; Johnson, Steffan <johnson.steffan@epa.gov>
Subject: do you know a hexavalent chromium expert in OAQPS?
Importance: High

Hi, Anne, Susan and Stef. Hope all is well. I don't know if you have heard about the colored glass manufacturer in Portland that DEQ discovered a cadmium hotspot around the facility. In the course of investigations, we discovered that the facility uses Cr+6 as a dry colorant for the glass. Ambient monitoring showed an average of 71.5 ng/m3 of total chromium. I don't know if Katie McClintock, the R10 enforcement contact has asked you for this information yet. If you can point us towards someone, we would really appreciate it. The company uses both Cr+3 and Cr+6, as well as cadmium and arsenic. In the next round of monitoring, the ODEQ will be monitoring for Cr+6 at the day care center, which is 220 meters from the facility. A cadmium hotspot was also detected close to the Harriet Tubman School. A much smaller colored glass

mfg facility is close by.

•□□□□□□□ Katie McClintock did a cursory search for information on the conversion of trivalent chromium to hexavalent chromium and found little information, all of which was talking about smelting and coating. The research confirmed that the use of trivalent chromium alone can still produce hexavalent chromium, but found little data on the conversion rate under various circumstances. We need to develop or find an expert who can read more literature and help interpret the data we find in stack tests and ambient monitoring.

Thanks!

==========

Madonna Narvaez

Regional Air Toxics Coordinator

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fax: 206-553-0110

narvaez.madonna@epa.gov

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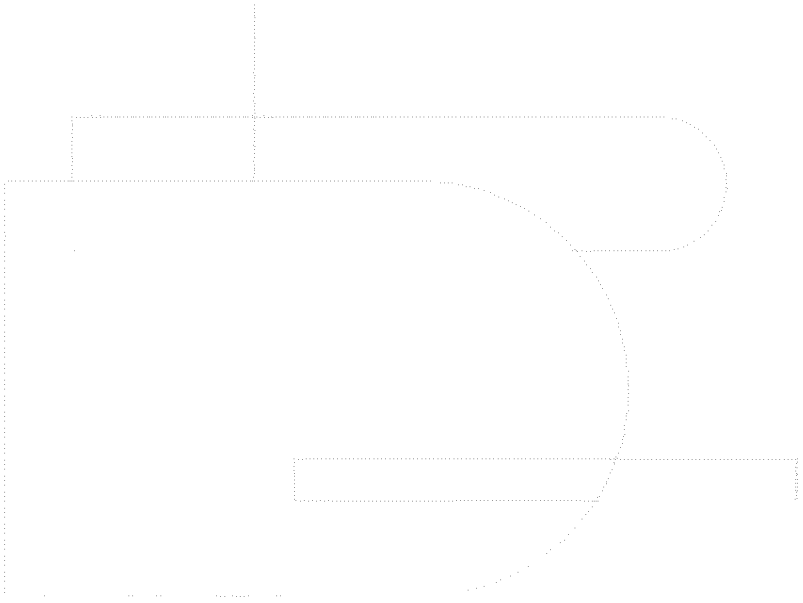
To: Fairchild, Susan[Fairchild.Susan@epa.gov]
From: McClintock, Katie
Sent: Tue 2/16/2016 7:49:59 PM
Subject: RE: do you know a hexavalent chromium expert in OAQPS?



So to make sure I follow, even if they do convert tri chrome to hex chrome in the heat of the furnace, you think a large amount might be converted back to tri chrome before it goes to people at ground level?

From: Fairchild, Susan
Sent: Tuesday, February 16, 2016 11:41 AM
To: McClintock, Katie <McClintock.Katie@epa.gov>
Subject: FW: do you know a hexavalent chromium expert in OAQPS?

Katie, Steff says that the Cr+6 will revert back to the Cr+3 unless kept in the hexavalent form using an alkaline reagent. WE used NaOH as that reagent in the Certainteed testing.

Susan Fairchild

Senior Environmental Scientist

(919) 541-5167

USPS Address:

OAQPS/SPPD/MMG

Mail Code D 243-04

Research Triangle Park, NC 27711

From: Johnson, Steffan
Sent: Tuesday, February 16, 2016 2:36 PM
To: Narvaez, Madonna <Narvaez.Madonna@epa.gov>; Pope, Anne <Pope.Anne@epa.gov>
Cc: Fairchild, Susan <Fairchild.Susan@epa.gov>; Dewees, Jason <Dewees.Jason@epa.gov>; Merrill, Raymond <Merrill.Raymond@epa.gov>
Subject: RE: do you know a hexavalent chromium expert in OAQPS?

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Cc: Fairchild, Susan <Fairchild.Susan@epa.gov>; Johnson, Steffan <johnson.steffan@epa.gov>
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To: Fairchild, Susan[Fairchild.Susan@epa.gov]
From: McClintock, Katie
Sent: Mon 2/15/2016 7:37:18 PM
Subject: hex chromium expert?

Is there anyone in your shop who is an expert on hex chrom or would you consider yourself one? I spent an hour or two this weekend trying to understand how much trivalent chromium will convert to hex chrome in a glass furnace. Bullseye has stopped using hex chrome but hasn't stopped use of tri chrome. The literature I could find was very lean and all I could see was that temperature and acids had an effect on the conversion and in industries like chrome plating, hex chrome was produced when only tri chrome was used (also in steel slag). I feel like I don't have the time to be our expert on this and was hoping we could find someone who could help be an expert. We may also find other chromium sources out of this and so having an expert may come in extra handy.

I fear we will have to wait for the ambient results to come back to determine if hex chrome is still measured after they stopped melting it, but if good science exists in the meantime and would substantiate major concerns and be sufficient for action, I want to make sure we know about it.

Any ideas? I'm happy to pass along the novice research I tried to do over the weekend, though it wasn't super fruitful.

Thanks.

Katie McClintock

Air Enforcement Officer

EPA Region 10

1200 Sixth Avenue, Suite 900, OCE-101

Seattle, WA 98101

Phone: 206-553-2143

Fax: 206-553-4743

Mcclintock.katie@epa.gov

To: Fairchild, Susan[Fairchild.Susan@epa.gov]
From: McClintock, Katie
Sent: Sat 2/13/2016 11:19:41 PM
Subject: "continuous furnace"

http://www.epa.ie/pubs/advice/brefs/glass.pdf

look at pdf page 96. It is talking about frit manufacturing. They don't seem to talk more broadly about stained glass, but I think frit is the most applicable category. Interesting the furnaces we see here neither are continuous nor discontinuous by their definitions. I'm looking forward to our chat Thursday after we see spectrum on wednesday

Katie McClintock

Air Enforcement Officer

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Mcclintock.katie@epa.gov

To: Topham, Nathan[Topham.Nathan@epa.gov]; Fairchild, Susan[Fairchild.Susan@epa.gov]; Throwe, Scott[Throwe.Scott@epa.gov]
From: McClintock, Katie
Sent: Fri 2/12/2016 7:23:34 PM
Subject: metals emissions controls

We are looking into the controls required for art glass manufacturers who emit vaporous metals (cadmium, arsenic, chromium, nickel, lead). Can any of you help me find a contact in HQ who would be an expert in these types of control devices (for any industry)? Obviously you need to condense the metals and then remove and there are a few ways to do that but curious if there are people who know more than that and about custom and small applications.

Katie McClintock

Air Enforcement Officer

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